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# Participation of Research Institute for Animal Production Nitra in the interlaboratory proficiency studies of ICAR

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The laboratory for milk quality of Research Institute for Animal Production (RIAP) as a member of ICAR Reference Laboratory Network every year takes part in Interlaboratory proficiency studies, also called international ring tests, with determination of fat, protein, lactose and somatic cell counting. Improving analytical practice shows the last differences between reference mean and laboratory mean ( $\Delta$ ), which are for every method not higher than 0.5 g/kg for milk composition and  $20 \times 10^3$ /ml for somatic cells count.

**Key words:** *Milk, analysis, interlaboratory study*

The laboratory for milk quality of Research Institute for Animal Production (RIAP) as a member of ICAR Reference Laboratory Network every year takes part in Interlaboratory proficiency studies, also called international ring tests. This laboratory works as a national ring test organiser and reference material supplier since it has been authorised as a master laboratory for centralised calibration of infrared milk analysers by Ministerium of Agriculture of Slovakia.

ICAR (International Committee for Animal Recording) laboratory network was created in 1996 and from this year the number of members has grown up to 33 from 28 countries. The participation in interlaboratory study programme is the occasion to favour and generalise good analytical practices. International network constitutes an effective tool to develop Quality Assurance and harmonise analytical practices in milk recording laboratories.

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## Summary

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## Introduction

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Since 1996, two interlaboratory studies have been carried out each year. They are organised by the French organisation CECALAIT (Centre d'Étude et de Contrôle des Analyses en Industrie Laitière) that operates under the umbrella of ICAR. During the past ten years CECALAIT, as an association of dairy laboratories, has developed and offered dairy laboratories services to optimise their performance and help in improving their quality systems.

*Table 1 Statistical treatment of the results concerning proficiency interlaboratory study.*

	Fat (g/kg)			Protein (g/kg)		
	Limit IDF	RIAP lab.	RIAP lab.	Limit IDF	RIAP lab.	RIAP lab.
		3/2000	9/2000		3/2000	9/2000
$\Delta$		-1.67	0.457		0.03	0.489
$\bar{d}$	+/-0.2	-0.67	0.45	+/-0.25	0.03	0.49
<i>Sd</i>	0.3	1.01	0.11	0.2	0.93	0.46
<i>D</i>	0.36	1.21	0.47	0.32	0.93	0.67
<i>SL</i>	0.1	0.05	0.09	0.2	0.68	0.55

  

	Lactose (g/kg)			Somatic cells count (10 <sup>3</sup> /ml)		
	Limit IDF	RIAP lab.	RIAP lab.	Limit IDF	RIAP lab.	RIAP lab.
		3/2000	9/2000		3/2000	9/2000
$\Delta$		-0.01	0.48		-5	21
$\bar{d}$	+/-1	-0.01	0.48	+/-35	-5	-64
<i>Sd</i>	1	1.52	0.32	35	13	56
<i>D</i>	1.41	1.52	0.58	50	14	85
<i>SL</i>	0.77	0.06	0.39	36	23	10

$\Delta$  - Difference of averages (mean of reference values - mean of RIAP laboratory results)

$\bar{d}$  - Mean of differences (individual sample reference value - RIAP laboratory result)

*Sd* - Standard deviation of the differences per sample

*D* - Euclidian distance to  $\bar{d}$  - *Sd* axes origin

*SL* - Repeatability (standard deviation of absolute differences between laboratory duplicates)

## Material and methods

In 2000 interlaboratory studies concerned the determination of fat, protein, lactose and somatic cell counting by our laboratory. Two trials were scheduled on March and September. Whole milk samples, preserved by bronopol, were sent by international delivery express carrier in isolated boxes with ice, with dispatching delay 1 to 3 days. According to our registration we received:

- 10 samples for determination of fat by Röse-Gottlieb, and protein by Kjeldahl;
- 10 samples for polarimetric determination of lactose;
- 10 samples for somatic cells counting by Fossomatic 90.

After the performing of analyses, the results in duplicates were reported on the appropriate report sheets and returned to CECALAIT. The results of the statistical data treatment (analysis of the laboratory's repeatability and accuracy) were sent anonymously to each participating laboratory, knowing only his identification number. As the reference values were taken the average values of 10 - 15 laboratories after elimination of extremes by Grubbs test at 5 % level.

Statistical treatment of the results concerning proficiency interlaboratory study is shown in table 1. Limit for Euclidian distance  $D$  define an acceptability area of the laboratory performances. Comparison of March and September RIAP laboratory  $D$ -value with IDF limit for used methods shows the step-by-step improvement of analytical practices. September differences between the reference mean and laboratory mean ( $\Delta$ ), are for every method not higher than 0.5 g/kg for milk composition and  $20 \times 10^3$ /ml for somatic cells count.

At the presentation on poster will be shown the graphical evaluation of accuracy.

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## **Results**

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